

REMARKS

By this amendment, applicants have amended claims 1 and 6 to recite that the light-emitting molecule is mixed into the spin conversion material. This amendment is supported by page 3, lines 13 - 14 of applicants' specification. Applicants have added claims 13 - 20 to define further aspects of the present invention. See, page 2, line 25 to page 3, line 3 of applicants' specification and Fig. 1.

Claims 1, 3 - 6 and 8 - 12 stand rejected under 35 USC 102(e) as being anticipated by US Patent No. 6,310,360 to Forrest et al. Applicants respectfully traverse this rejection and request reconsideration thereof.

The present invention relates to an electroluminescent film device in which the light-emitting layer contains the spin conversion material set forth in the claims and a light emitting molecule mixed into the spin conversion material. This would have neither disclosed nor suggested by Forrest et al.

The difference in the structure between the present invention and Forrest et al attains the advantageous effect as described below.

The excited state generated in the light-emitting layer has a statistical annihilation life and an average movement length. Prior to expiration of life, part of the excited state moves to the light-emitting molecule and is converted to a photon while part of the excited state is captured by devitalizing defects and extinguished without light emission. Moreover, a triplet excited state does not contribute to the light emission of a single light emitting molecule. Therefore, in order to enhance light emission efficiency, it is quite important that the excited state rapidly moves to the light-emitting molecules to emit light. The light emission efficiency is remarkably

enhanced by shortening the distance between a portion which has a spin conversion function and the light-emitting molecule.

In this respect, it is advantageous that a light-emitting molecule is mixed into the spin conversion material as set forth in claims 1 and 6. It is also preferable that the light molecules are directly surrounded by the spin conversion material as set forth in new claims 15 and 16.

Forrest et al would not have disclosed or suggested the claimed structure or the advantageous effect obtained thereby.

Therefore, the present invention is patentable over Forrest et al.

Forrest et al describes a material in which, on a base material composed of CBP (4,4'-N,N'-dicarbazole-biphenyl), there are separately provided a layer to which a spin conversion material is added, and another layer in which a light-emitting molecule is added, as shown in Fig. 1. In the present invention, on the other hand, a spin conversion material, a light-emitting molecule and a base material are simultaneously deposited, and molecules of these materials are present in a mixed state. Thus, the material in Forrest et al is clearly different from the material of the present invention in structure, and not just in the process in which the material is made.

In Forrest et al, the light-emitting molecule is in a different layer than the spin conversion material; thus, the average distance between the spin conversion material and light-emitting molecule is approximately 10 to 100 times greater. Thus, the possibility of failure in light emission owing to extinguishment of the exciton is higher, and a considerable number of the excitons disperse in a direction opposite to the light-emitting layer, resulting in extinguishment without light emission. In the present invention, on the other hand, the materials are mixed as described above so

that efficiency of light emission is higher as compared with that of the structure of Forrest et al wherein the three materials are contained in the separate layers.

(Incidentally, the light emission efficiency is further improved when a spin conversion material is used as a base material.) The structure of the present invention and the advantages obtained thereby are neither disclosed nor suggested by Forrest et al.

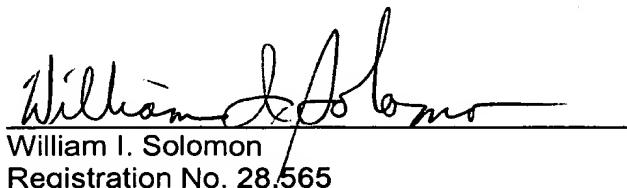
The Examiner, noting the disclosure at column 14, lines 65 - 67 of Forrest et al, alleges Forrest et al to teach that further improvement may be expected by mixing the host, phosphorescent sensitizer and fluorescent dye. However, the Examiner's allegation amounts to nothing more than an allegation of "obvious to try." Clearly, such an allegation does not satisfy the level of evidence necessary to support an obviousness rejection, much less an anticipation rejection.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 500.40580X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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